

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

C 1. (Currently Amended) A tire comprising:
a tread;
grooves formed in said tread for defining a plurality of blocks; and
a plurality of smaller grooves formed in the walls of at least one of said grooves formed in said tread, so as to extend only in a longitudinal direction of said at least one groove,
wherein said smaller grooves have a depth set within a range of 0.01 to 0.5 mm and a pitch set within a range of 0.01 to ~~[[0.5]]~~ 0.4 mm, and
the smaller grooves intentionally generate a relatively high number of minute vortexes along the walls of said at least one groove, thereby decreasing friction resistance between water and the groove wall surface.

2. (Original) A tire according to Claim 1,
wherein the depth of said smaller grooves is set within a range of 0.05 to 0.4 mm, and the pitch of said smaller grooves is set within a range of 0.05 to 0.4 mm.

C 3. (Previously Presented) A tire according to Claim 2,
wherein the sectional shape, as taken at a right angle with respect to the longitudinal direction, of said smaller grooves is made symmetric with respect to the widthwise center lines of said smaller grooves.

4. (Original) A tire according to Claim 3,
wherein the sectional shape, as taken at a right angle with respect to the longitudinal directions, of said smaller grooves is an isosceles triangle.

5. (Previously Presented) A tire according to Claim 1,
wherein a relation of $P \leq 2D$ is satisfied and the depth of said smaller grooves is designated by D and the pitch of said smaller grooves is designated by P.

6. (Previously Presented) A tire according to Claim 1,
wherein said smaller grooves are formed in the groove walls continuing in the circumferential direction.

7. (Previously Presented) A tire according to Claim 1,
wherein said smaller grooves are juxtaposed in parallel and define undulating groove wall surfaces.

8. (Original) A tire according to Claim 1,

wherein the vicinity of the bottom of said groove is free of said smaller grooves.

9. (Previously Presented) A tire according to Claim 1,

wherein the walls in the vicinity of the intersection of said groove and another said groove are provided with turbulence generating zones for generating minute turbulences in a fluid flowing in the vicinity of the groove walls thereby to suppress separation of the fluid flowing in said groove.

10. (Original) A tire according to Claim 1,

wherein the walls in the vicinity of the opening of said groove on the tread surface side are provided with turbulence generating zones for generating minute turbulences in a fluid flowing in the vicinity of the groove walls thereby to suppress separation of the fluid flowing in said groove.

11. (Original) A tire according to Claim 9,

wherein said turbulence generating zones have a multiplicity of pointed projections having a diameter within a range of 0.01 to 0.5 mm and a height within a range of 0.01 to 0.5 mm.

c 12. (Currently Amended) A tire comprising:

a tread;

grooves formed in said tread for defining a plurality of blocks; and

a plurality of smaller grooves formed in the walls of at least one of said grooves formed in said tread, so as to extend in a longitudinal direction of said at least one groove,

wherein said smaller grooves have a depth set within a range of 0.01 to 0.5 mm and a pitch set within a range of 0.01 to 0.5 mm,

wherein the walls in the vicinity of the intersection of said groove and another said groove are provided with turbulence generating zones for generating minute turbulences in a fluid flowing in the vicinity of the groove walls thereby to suppress separation of the fluid flowing in said groove, and

wherein said turbulence generating zones have a multiplicity of recesses having a diameter within a range of 0.01 to 0.5 mm and a depth within a range of 0.01 to 0.5 mm.

13. (Original) A tire according to Claim 1,

wherein the pitch of said smaller grooves is set larger on the bottom side of said groove than on the side of the tread surface.

14. (Original) A tire according to Claim 1,
wherein the depth of said smaller grooves is set larger on the bottom side of said groove
than on the side of the tread surface.

15. (Original) A tire comprising:
a tread;
grooves formed in said tread for defining a plurality of blocks; and
a plurality of smaller grooves formed in the walls of at least one of said grooves formed in
said tread, so as to extend in a longitudinal direction of said at least one groove,
wherein said smaller grooves have a depth set within a range of 0.01 to 0.5 mm and a pitch
set within a range of 0.01 to 0.5 mm,
wherein groove wall faces of a larger size and groove wall faces of a smaller size in the
longitudinal direction are compared, and said smaller grooves have a larger depth and/or a larger
pitch in the groove wall faces of the shorter size than in the groove wall faces of the longer size.

16. (Previously Presented) A tire according to Claim 1, comprising:
a tread;
grooves formed in said tread for defining a plurality of blocks;

a plurality of smaller grooves formed in the walls of at least one of said grooves formed in said tread, so as to extend in a longitudinal direction of said at least one groove,

wherein said smaller grooves have a depth set within a range of 0.01 to 0.5 mm and a pitch set within a range of 0.01 to 0.5 mm;

a first land portion;

a second land portion defined by a plurality of grooves and adjoining said first land portion across a first groove; and

a third land portion defined by a plurality grooves and adjoining said first land across said first groove, said third land portion having a wall face which faces the first groove and has a smaller size in the longitudinal direction than a wall face of the second land portion which faces the first groove,

wherein in the wall face of said first land portion which faces the first groove, the depth and/or the pitch of said smaller grooves is larger in the portions confronting said third land portion than in the portions confronting said second land portion.

17. (Previously Presented) A tire comprising:

a tread;

grooves formed in said tread for defining a plurality of blocks; and

a plurality of smaller grooves formed in the walls of at least one of said grooves formed in said tread, so as to extend in a longitudinal direction of said at least one groove,

wherein said smaller grooves have a depth set within a range of 0.01 to 0.5 mm and a pitch set within a range of 0.01 to 0.5 mm,

wherein the tread is provided with: a plurality of grooves extending along the tire circumferential direction; and a plurality of grooves extending along the tire widthwise direction, and

wherein the walls of the grooves extending along the tire circumferential direction are free of said smaller grooves in a portion thereof intersecting prolongations of the grooves extending along the tire widthwise direction, as connected with the grooves extending along said tire circumferential direction.

18. (Original) A tire according to Claim 1,

wherein said smaller grooves are undulated to have an amplitude with respect to a reference line parallel to the surface of said tread, and wherein said smaller grooves have a period set within a range of 2 to 60 mm and an amplitude set within a range of 0.1 to 3 mm.

19. (Previously Presented) A tire according to Claim 1,

wherein the at least one groove extends along the tire circumferential direction, and said smaller grooves are provided in plurality at a spacing in the tire circumferential direction and are so inclined with respect to said tread surface that the distance from said tread surface is increased the more in the tire rotating direction in the vicinity of the grounding surface of the tire, and are made parallel to the road surface at least at their end portions on the tire advancing side in the region of the grounding surface on the tire advancing side and within a range of no more than 5 mm from the road surface.

20. (Previously Presented) A tire according to Claim 1,

wherein when a rib-shaped portion formed between said smaller grooves is viewed in a section normal to the longitudinal direction, relations of $L2 \geq 0.6 L1$ are set: and the intersection between a prolongation of the wall face of one smaller groove on the bottom side thereof and a prolongation of the wall face of the other smaller groove on the bottom side thereof is designated by point A; and the intersection between the wall face of said rib-shaped portion of the one smaller groove on the crest side thereof and the wall face of the rib-shaped portion of the other smaller groove on the crest side thereof is designated by point B; and the distance from a virtual line joining the bottom of the one smaller groove and the bottom of the other smaller groove to said point A is designated by L1; and the distance from said virtual line to said point B is designated by L2.

21. (Previously Presented) A tire according to Claim 1,

wherein the wall of said smaller groove on the tread surface side is designated by a first groove wall and the angle of inclination of said first groove wall with respect to a line normal to the wall of the groove where said smaller groove is formed is designated by θ_1 , said inclination angle θ_1 is set larger on said first groove wall of the smaller groove formed on the bottom side of said groove than on said first wall of the smaller groove formed on the tread surface side.

22. (Previously Presented) A tire according to Claim 21,

wherein the wall of said smaller groove on the bottom side of said groove is designated by a second groove wall and an angle, as contained between said first groove wall and said second wall is designated by θ_2 , said angle θ_2 is set larger of said smaller groove formed in the bottom side of said groove than of the smaller groove formed in the tread surface side.

23. (Previously Presented) A tire according to Claim 1,

wherein the bottom of said smaller groove is shaped to have a generally arcuate shape, when viewed in a section normal to the longitudinal direction of said smaller groove, and the rib-shaped portion between the smaller grooves is shaped to have an acute angle less than 90 degrees at its crest.

24. (Original) A tire according to Claim 1,

wherein said smaller grooves are absent in the vicinity of the tread surface.